SIGNAMAX
CONNECTIVITY SYSTEMS

**Signamax™ Connectivity Systems
100BaseTX to 100BaseFX
Media Converter
Model 065-1100NS
Mode 065-1110NS
Mode 065-1120NS Series**

U S E R ' S   G U I D E

SignamaxTM **Connectivity Systems**

100BaseTX to 100BaseFX
Media Converter Series
065-1100NS
065-1110NS
065-1120NS

User's Guide

FCC Warning

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Trademarks

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- Ethernet is a trademark of Xerox Corporation.

- Microsoft Windows is a trademark of Microsoft Corporation.

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TABLE OF CONTENTS

APPENDIX C:

1

INTRODUCTION

About This Guide

Welcome
Thank you for choosing the 100BaseTX to 100BaseFX Media Converter. This device integrates Fast Ethernet copper and fiber segments in a highly flexible package.

Purpose
This guide discusses how to install and configure your 100BaseTX to 100BaseFX Media Converter.

Terms/Usage
In this guide, the term "Converter" (first letter upper case) refers to your 100BaseTX to 100BaseFX Media Converter, and "converter" (first letter lower case) refers to other converters.

Features

- Complies with EIA/TIA and IEEE standards

- Complies with IEEE 802.3u 100BaseTX & FX standards

- MDI/MDI-X push button selection for RJ-45 port

- Supports Half/Full Duplex Auto-Negotiation

- Slide switch to enable/disable auto-negotiation operations

- Support ST, SC, and WDM fiber connectors

- Extends fiber distance of up to 2km (6600 feet) for multimode and up to 60km (198000 feet) for long-haul single mode

- Compatible with other 100BaseTX & FX devices

- Status LEDs

- External power supply options

- Used with the Mini Converter Chassis for internal power supply

- FCC Class A & CE approved

Specifications

Standard: IEEE 802.3u

Connector: 1 x ST or SC fiber optic
         1 x RJ-45

Max. Distance: Twisted Pair: 100 m (330 ft)
              Full Duplex- MM Fiber: 2,000 m (6,600 ft)
                          SM Fiber: 20 km (66,000 ft)
                          Long Haul SM Fiber: 60 km
                          (198,000 ft)
              Half-duplex - MM Fiber: 412 m (1,360 ft)

Unit LEDs: Power: Green- illuminated for normal
                    converter operation

  Port LEDs: LNK: Green - illuminated when connectors
                          are attached
            RCV: Amber - flashing or illuminated when
                          receiving packets.
            FD: Green- illuminates when in full duplex
                          mode.

Power: External power supply, 12V DC@0.8A

Temperature: Operating: 32º to 122º F (0º to 50º C)
              Storage: -4º to 158º F (-20º to 70º C)

Humidity: Operating: 10% to 80% RH
           Storage: 5% to 90% RH

Emissions: FCC Part 15 of Class A & CE approved

Dimensions: 109.2 x 73.8 x 23.4 mm (L x W x H)

Switches: Push button switch: MDI/MDI-X selection for the
                              RJ-45 connector
          NWay slide switch: NWay Auto-negotiation
                             ON/OFF function for the
                             RJ-45 connector

Package Contents

The 100BaseTX to 100Base-FX Converter packaged should include:

- One converter

- One AC adapter (for external power supply)

- Four pieces self-adhesive pads

- One user' s manual

2

HARDWARE DESCRIPTION

Product Overview

The Converter is primarily designed for larger workgroups, demanding more speed and bandwidth, and requiring expansion of the Fast Ethernet network.

It features a MDI/MDI-X crossover "push button" switch for direct connection to the workstation, switch or hub. Now the network manager does not need to worry about the cable configuration (crossover or straight through) when establishing a connection between RJ-45 ports.

The Converter features both a RJ-45 jack, and a ST, SC, or WDM fiber optic connector that allows it to connect a 100BaseTX (copper) network to the 100BaseFX (fiber) network.

It features Auto-Negotiation support which allows the Converter to support connections with leading NWay-capable Switches. At full duplex, the Converter can create potential distances of up to 2 kilometers for multimode fiber and 60 kilometers for long haul single mode fiber between a LAN switch, hub or a file server.

Note: It is not recommended to use the Converter in half-duplex mode, since the maximum spanned distance is limited to 412 meters.

Front Panel View with SC and RJ-45 Connectors
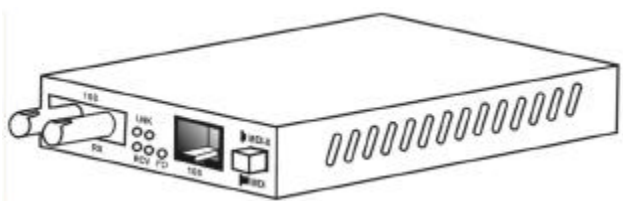
Front Panel View with ST and RJ-45 Connectors

3

INSTALLATION

Installing Your Converter

In this chapter, we will take a look at how to install converters within its operating environment. First, it is important to unpack the Converter and ensure that all the components listed in Package Contents are present.

- Location
- MDI/MDI-X Connection
- NWay Push-Button Switch Setting
- Installing Converter
- Desktop Installation
- Powering On Unit
- Connecting Fiber Cable
- Connecting Copper Cable

Location

The location selected for installing the Converter may greatly affect its performance. When selecting a site, we recommend considering the following rules:

1. Install the Converter in a fairly cool and dry place. See Technical Specifications for the acceptable temperature and humidity operating ranges.

2. Install the Converter in a location free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.

3. Leave at least 10 cm of space at the front and rear of the unit for ventilation.

4. Affix the provided rubber pads to the bottom of the Converter for grip, and to protect the case from scratching.

MDI/MDI-X Connection

The MDI / MDI-X function alleviates the worry of cable type configuration used for connecting the converter with a 100BaseTX device. Simply follow the chart below when connecting the Converter, and use the push button to select MDI or MDI-X accordingly.

Device	Cable Configuration	Selection
Hub or Switch	Straight Through	Select MDI
Hub or Switch	Crossover	Select MDI-X
DTE (NIC)	Straight Through	Select MDI

Crossover Selection Table
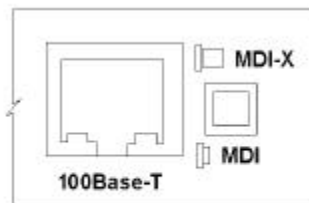
Location of Crossover Switch

NWay Push Button Switch Setting

Use the NWay push button switch to activate NWay operations.

Note: Factory NWay switch default is set to the ON position.

- **ON:** Activates the NWay auto-negotiation operation mode. Set the NWay switch to ON when connecting to an auto-negotiation device. The function will determine the highest possible speed and duplex mode in the copper segment.

- **OFF**: Deactivates the NWay auto-negotiation operation mode. Set the NWay switch to OFF when connecting to an auto-sensing device that only supports 10/100 detection. Some early switch models only support auto-sensing of speed, and NOT auto-detection of both speed and duplex mode (auto-negotiation).

Note: Setting the duplex mode is feasible while the media converter is "on-line".

Install the converter

This Converter utilizes ports with fiber and copper port connectors, functioning under the Fast Ethernet protocol.

100BaseTX Port

The 100BaseTX port supports a network speed of 100Mbps, and can operate in half and full duplex transfer modes. This port also offers MDI/MDI-X crossover detection that gives true "plug and play" capability - just plug in the network cable to the port and adjust the push-button according the chart above. The RJ-45 connector is suitable for UTP cable Category 3, 4, 5 or better.

100BaseFX Port

The 100BaseFX port adds a fiber Fast Ethernet link to your network device. Compliant with IEEE 802.3u, this port can transmit data at 100Mbps in full duplex mode across distances of up to 2km through multimode fiber optic cable. The fiber port has a choice of ST or SC fiber connector types for multimode models, and SC connectors are used on singlemode models.

Desktop Installation

Follow the instructions listed below to install the Converter onto a desktop location.

1. Locate the Converter in a clean, flat and safe position that has easy access to AC power.

2. Affix the four (4) self-adhesive rubber pads to the underside of the Converter

3. Apply AC power to the Converter. (The green PWR LED on the front panel should light)

4. Connect cables from the network partner devices to the ports on the front panel. (The green LNK LED on the front panel associated with the port should light)

This Converter can also be mounted on a vertical surface. Simply use the underside of the unit as a template to measure and mark out the position of the holes on to the surface where the unit is to be installed. Then use the two screws provided to mount the Converter firmly in place.

Warning Please exercise caution when using power tools. Also, install this unit away from damp or wet locations, or in close proximity to very hot surfaces. These types of environments can have a detrimental effect on the converter and cables. An ideal location is a lightly cooled place such as a typical equipment room.

Connecting To Power

The Converter uses an external power supply rated at 12V DC @ 0.8A 50~60 Hz.

1. Insert the power cable plug directly into the receptacle located at the back of the device.

2. Plug the power adapter into an available socket.

3. Check the front-panel LEDs as the device is powered
    on to verify that the Power LED is lit. If not, check that
    the power cable is correctly and securely plugged in.

*Note: For International use, you may need to change the AC power
adapter cord. You must use a power cord set that has been
approved for the receptacle type and electrical current in your
country.*

Connecting Fiber Cable

When connecting fiber cable to a 100BaseFX port on the
Converter, be sure the correct type – ST or SC - connector
is used. Follow the steps below to properly connect fiber
cable:

1. Remove and keep the ST/SC port's rubber cover. When
    not connected to a fiber cable, the rubber cover should
    be replaced to protect the optics.

2. Check that the fiber terminators are clean. You can
    clean the cable plugs by wiping them gently with a clean
    tissue or cotton ball moistened with a little ethanol. Dirty
    fiber terminators on fiber optic cables will impair the
    quality of the light transmitted through the cable and lead
    to degraded performance on the port.

3. Connect one end of the cable to the ST/SC port on the
    Converter and the other end to the ST/SC port on the
    other device.

4. Check the corresponding port LED on the Converter to
    be sure that the connection is valid. (Refer to the LED
    chart in next section.)

*Note: When inserting the cable if SC connectors are used, be sure the tab
on the plug clicks into position to ensure that it is properly seated.*

⚠ **Warning** **Because invisible laser radiation may be emitted from the aperture of the fiber port when no cable is connected, avoid exposure to laser radiation and do not stare into the open apertures.**

Connecting Copper Cable

The 100BaseTX RJ-45 Ethernet port fully supports auto-sensing and auto-negotiation.

1. Insert one end of Category 5 twisted pair cable into an available RJ-45 port on the Converter and the other end into the port of the network node.

2. Check the corresponding port LED on the Converter to make sure that the connection is valid. (Refer to the LED chart in the next section)

4

LED INDICATORS

This Converter has LED indicators located at the front of the device. The LEDs have been designed to give easy at-a-glance network status, and provides ' real-time' connectivity information. Please see below for an interpretation of their functions:

LED Indicators		
LED	**Condition**	**Status**
PWR	On (Green)	Converter is receiving power
	Off	Power off or failure
LNK	On (Green)	Illuminated when connectors are attached
	Flashing (Green)	Data traffic passing through port
	Off	No link established
FDX	On (Green)	Port is operating at full duplex
	Off	Port is operating at full duplex
RCV	On (Amber)	Receiving data packets
	Flashing	Receiving data packets at a slower rate
	Off	No data packets received

A
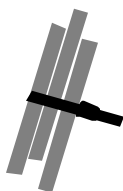
APPENDIX A

Cables

The following are some recommendations as to what you should and should not do when installing cables. Remember - cables are the deciding factor in network performance.
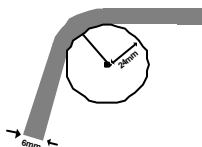
Try to maintain a bend radius of (min.) 4x the diameter of the cable for UTP and 100x for fiber.

Try not to allow the cable to twist too much - this creates a strain on the internal cables.

Place cable ties at regular intervals - do not over tighten cable ties - try to avoid using with fiber.

Do not stretch the cable especially on corners, in vertical cable trays and when spanning long distances.

B

APPENDIX B

About RJ-45 Cables

When connecting your network devices, use standard Category 3 eight-way cables for 10Base-T configurations and Category 5 cable for 100BaseTX. The pin assignments are as follows:

Pin	1	TD+	Pair	2	White/Orange
Pin	2	TD-	Pair	2	Orange/White
Pin	3	RX+	Pair	3	White/Green
Pin	4	N/A	Pair	1	Blue/White
Pin	5	N/A	Pair	1	White/Blue
Pin	6	RX-	Pair	3	Green/White
Pin	7	N/A	Pair	4	Brown/White
Pin	8	N/A	Pair	4	Brown/White

| Application	Cable Type	Application
Converter to Converter or Network Adapter	Straight-through Cable	Converter End / Hub 1 ←→ 1 2 ←→ 2 3 ←→ 3 6 ←→ 6
Converter to Switch	Cross-Over Cable	Converter End #1 / Converter End #2 1 ←→ 1 2 ←→ 2 3 ←→ 3 6 ←→ 6

C

APPENDIX C

Application Diagram I

In the figure below, the Converter is functioning as a high-speed bridge between switches creating increased capacity for each user (node) on the local area network. It is providing a 100Mbps full duplex link to a variety of Fast Ethernet network devices within a LAN.
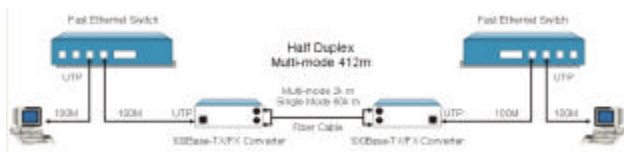

Application Diagram II

In the figure below, the Converter is functioning as a server aggregation for an enterprise or LAN configuration. It is providing a 100Mbps full duplex link to a workgroups of 10/100 switches located on separate floors within a single building.
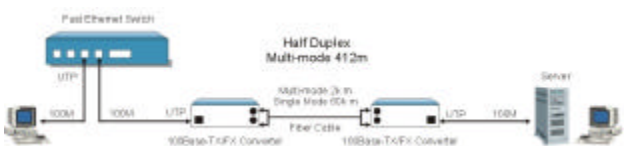
Application Diagram III

In the figure below, the Converter is functioning as a high-speed dedicated link within a campus network configuration. It is providing a 100Mbps full duplex link to a remote network node.

D
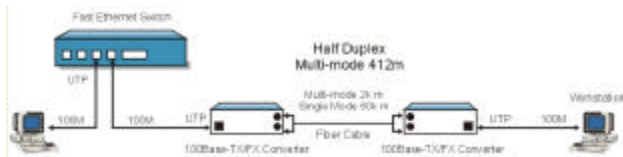
CONTACT INFORMATION

SIGNAMAXÔ CONNECTIVITY SYSTEMS
An AESP Company
1810 N.E. 144th Street.
North Miami, Florida 33181, U.S.A.
Phone: 305-944-7710 Fax: 305-652-8489
Sales: 800-446-2377 Tech. Support: 800-446-2377, ext. 201
Http://www.signamax.com
E-mail: info@signamax.com

EUROPE

AESP Ukraine. (UKRAINE)
2 Timiryazevskaya St. 47
252014 Kiev, Ukraine
Phone: +380 44 296.53.57
Fax: +380 44 294.88.60
Http://www.aesp.com.ua
E-mail: aesp@aesp.com.ua

AESP Sweden. (SWEDEN)
Grevegatan 19-21 SE-815
40 TIERP. SWEDEN
Phone:+46-(0)-293-228 88
Fax:+46-(0)-293-228 89
Phone:+49-81-35-9303-0
Http://www.aesp.se
E-mail: info@aesp.se

JOTEC AESP AS. (NORWAY)
Telefon 23 14 17 00 Ordrefax 23
14 17 10 Karihaugveien 102
Postboks 50 Ellingsrudasen 1006
Oslo, Norway
Phone:+47-23-14-1700
Fax:+47-23-14-1710
Http://www.jotec.no
E-mail: jotec@jotec.no

AESP Russia. (RUSSIA)
Kronshtadtsky Blv.
125499 Moscow, Russia
Phone:+7 095-456-0704
Phone:+7 095-456-0344
Fax:+7 095-454-3040
Http://www.aesp.ru
E-mail: aesp@aesp.ru

AESP Germany GmbH
(GERMANY)
Weisserfelderstr.2 D-85551
Kircheim b. München, Germany
Phone:+49-89-901-097-0
Fax:+49-89-901-097-22
E-mail: aesp.info@t-online.de

INTELEK spol.s.r.o
(CZECH REPUBLIC)
Vlarska 22,
Brno, CZ 62700
CZE Czech Republic
Phone: +420-5-481-27248
Fax: +420-5-481-27247
Http://www.intelek.cz
E-mail : info@intelek.cz